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(71) Applicant
Armsted Industries Incorporated (USA-Delaware),
3700 Prudential Plaza, Chicago, IL 60601, United States of
America

(72) Inventor
Russell George Altherr

(74) Agent and/or Address for Service
Frank B. Dehn & Co., Imperial House, 15-19 Kingsway,
London WC2B 6UZ

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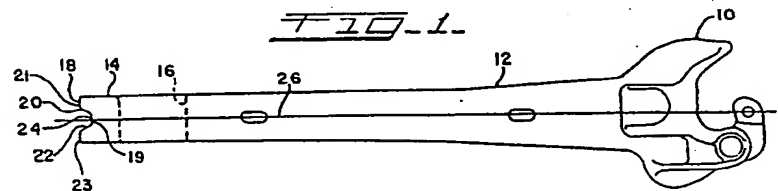
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(54) Railway couplers

(57) The end face 18 of a butt end portion 14 of coupler shank 12 includes a vertical recess 19. The recess is defined by two angled side walls 20,22 and a rear wall 24. A follower block 50 includes a vertically extending projection 62 in its face adjacent the coupler butt end portion, such projection having two angled side walls 64,66 and a front face 68. The projection 62 co-operates with the recess 19 to limit relative horizontal movement of the shank 12.



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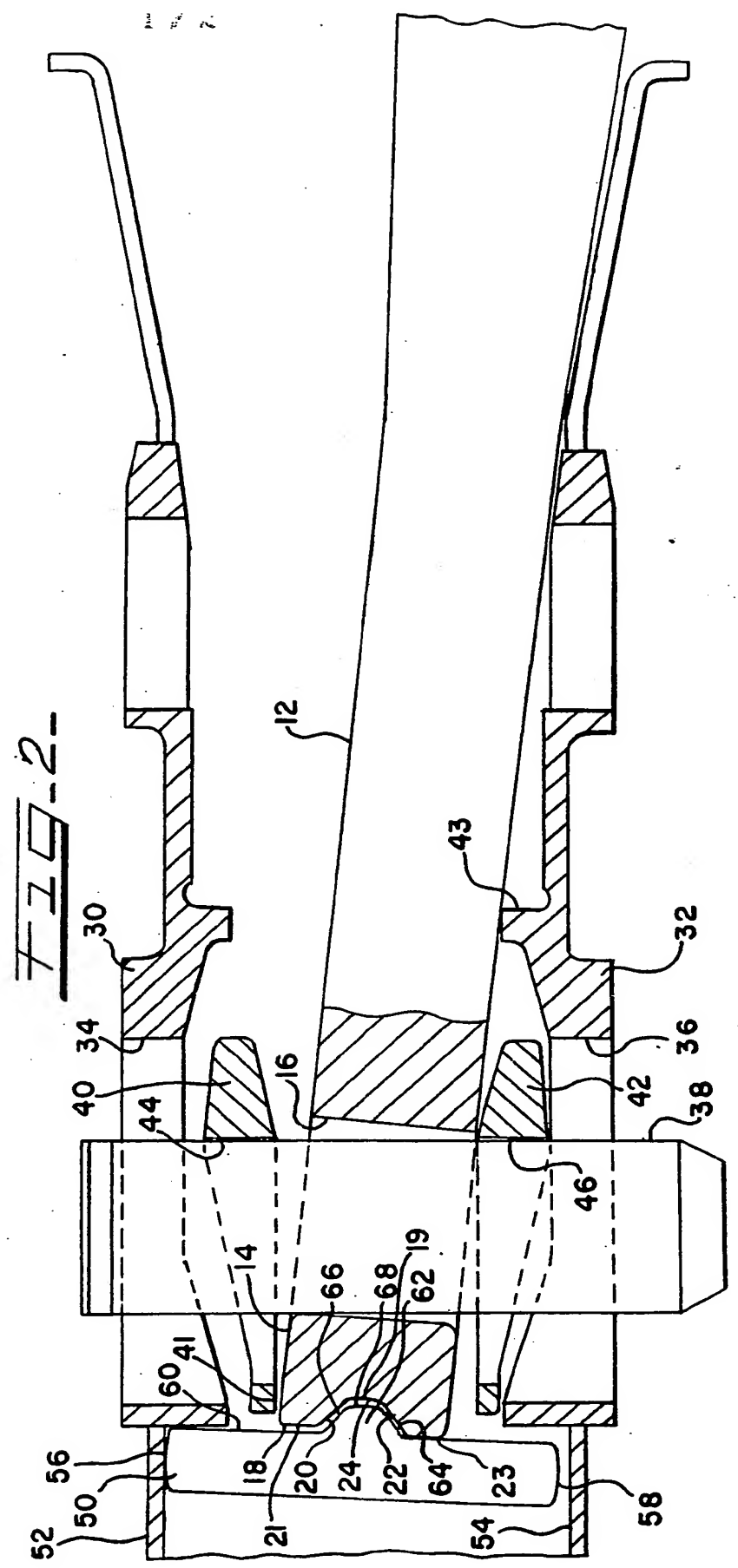
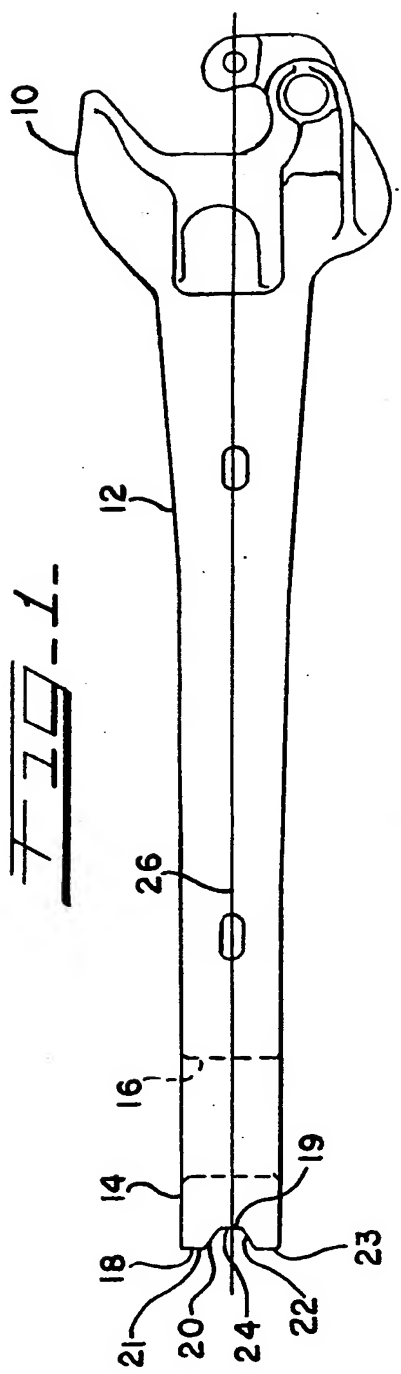
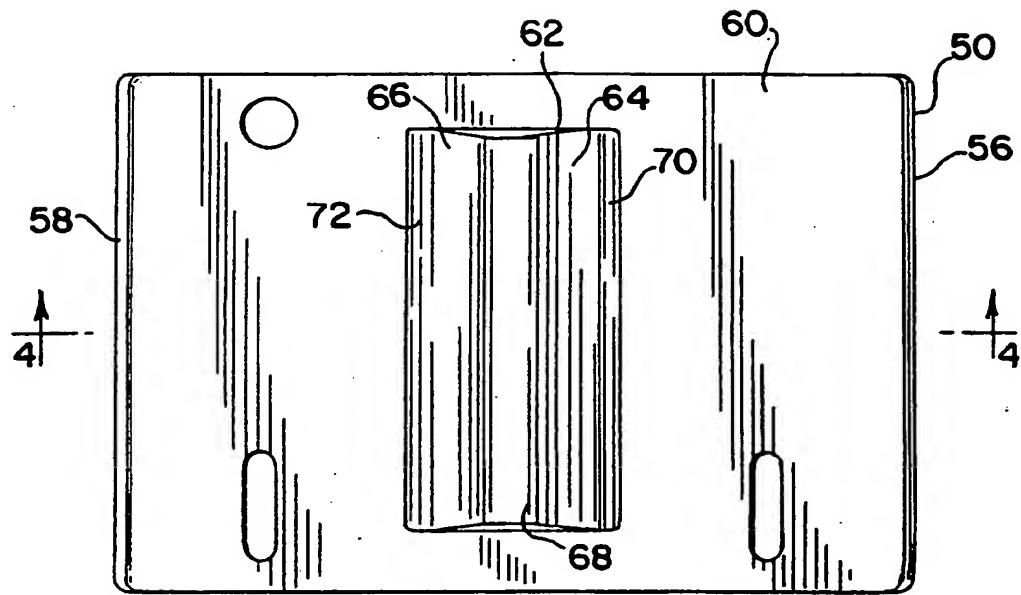
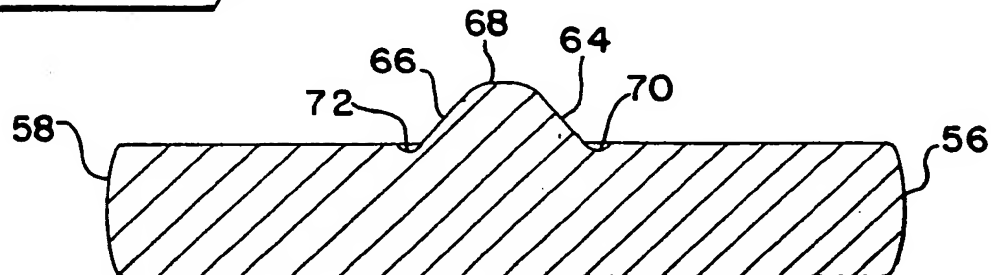


FIG-3-FIG-4-

SPECIFICATION

Railway couplers

5 The present invention relates generally to railway coupler connections and, more particularly, to an improved coupler shank - follower interface.

In standard Association of American Railroads (AAR) E type couplers, the main body of the coupler comprises a coupler head affixed to an elongated shank. Depending on the desired car application, the length of the shank can vary from 12 in. (30.5 cm) to 54 in. (137 cm) or more. The butt end of the coupler shank is most typically a flat, planar section, which abuts the front flat face of a generally rectangular follower block maintained in a yoke and car center sill. Such a flat coupler butt and follower block interface provides a degree of horizontal alignment control to the car by virtue of the lateral eccentricity of buff (compaction) load transmitted through the side edges of the coupler butt relative to the car longitudinal centerline. This occurs when the railway car coupler is laterally angled from that car centerline. The magnitude of lateral force eccentricity is dependent upon any lateral displacement of the coupler butt from the longitudinal center line of the car that is necessary to accommodate limited horizontal angling.

One attempt in controlling the horizontal displacement of the coupler butt is a Farlow draft gear arrangement wherein a follower block is provided with a centrally located pin extending from one face thereof. The coupler shank has a longitudinal hole to receive the pin thereby providing some degree of stability for the coupler butt position. This arrangement does not provide the desired bearing area and a cooperating hole in the coupler butt limited its serviceability.

In another known design a vertically extending semicircular groove is provided in a coupler butt, and a vertically extending semicircular projection is provided on the mating face of the follower block. This arrangement provides a better degree of control of the coupler-follower force eccentricity to the car center line than does the Farlow arrangement but does not provide adequate lateral bearing surface as the coupler butt and follower surfaces are guided into engagement.

Accordingly, it is an object of the present invention to provide an improved coupler butt - follower block interface.

Viewed from one aspect the invention provides a railway coupler comprising an elongate shank received in a center sill structure, the shank having a butt end portion, the end face of which is provided with a vertical groove such groove being defined by two outwardly angled side walls and a rear wall extending between said side walls, the coupler further comprising a follower block of a generally rectangular shape having a vertical projection extending from a front face thereof, such projection being defined by two angled side walls and a front wall extending between said side walls, wherein the follower block projection is adapted to be received in the vertical groove of said shank end face so as to

limit relative horizontal movement of the shank butt end portion.

The present invention thus provides a railway coupler arrangement having an improved coupler butt end face - follower block interface.

In a preferred embodiment the coupler may comprise a main section having a coupler head and integral elongated shank extending therefrom. The coupler and shank may be of an AAR E type, wherein the shank is held to a yoke structure by a horizontal key passing through slots in two sides of the yoke structure and through an accommodating horizontal slot in the end of the coupler shank. The butt end face of the coupler shank is preferably a flat, generally rectangular surface, and is adjacent a generally rectangular follower block which is also received in the yoke. The butt end face of the coupler shank has a vertically extending groove which preferably extends substantially from the top to the bottom of the butt end face. This groove is formed by two angled side walls extending inwardly to the rear wall. Sections of the face to either side of the vertical groove preferably form edge face walls. In a preferred embodiment the sides of the groove extend at an angle of between 30 to 45° to the longitudinal axis of the shank.

The follower block is a generally rectangular device advantageously received between the upper and lower yoke straps. The front face of the follower block which is adjacent the butt end face of the coupler shank has a raised projection extending preferably from near its top edge to near its bottom edge in line with the vertical center line of the follower block. The projection is formed by two side walls joined by a front wall or face. In a preferred embodiment each side extends at an angle between 30 and 45° to a plane normal to the front face of the follower block.

When the coupler shank is centered horizontally in the yoke and center sill structure, under a buff or compression force, the end face walls of the shank butt will flushly contact the front face of the follower block. Preferably the depth of the groove of the butt end face of the coupler shank is greater than the height of the projection outward from the follower block, so that no contact occurs between the front wall of the follower block projection and the rear wall of the groove in the centered condition. Horizontal movements of the shank butt portion in the yoke and center sill structure due to horizontal displacement angling of the coupler head are limited owing to contact of one of the angled side walls of the groove of the shank butt end face with one of the side walls of the follower projection. Accordingly, depending on the length of the coupler shank and the desired maximum horizontal angling of the coupler shank in the center sill, the angles and relative sizes of the shank butt end face groove and follower projection can be adjusted to ensure that the desired contact will occur between a side wall of the groove and a side wall of the follower block projection within the range of the lateral location of the follower block as controlled by the relative spacing of the follower block sides and the inside wall of the center sill. Under the most adverse conditions, the follower

block will be displaced laterally so that a side edge portion of the shank will contact an inside wall of the center sill or yoke.

The angling of the edges of the shank butt end face groove and the side walls of the follower block projection may vary, but advantageously such angling is complementary. This ensures flush contact between each side wall of the groove and the corresponding side wall of the projection.

An embodiment of the invention will now be described, by way of example only, with reference to the accompanying drawings, wherein:

Figure 1 is a top view of a coupler head and extended length shank in accordance with the present invention;

Figure 2 is a top partial view of a coupler shank, yoke, car sill structure and follower block in accordance with the present invention;

Figure 3 is a front view of the follower block face having the projection extending therefrom and,

Figure 4 is a cross section through lines 4-4 of the follower block of *Figure 3*.

Referring now to *Figure 1* of the drawings, a railway coupler includes a head 10 shown as a one-piece cast metal assembly having an elongated, generally rectangular shank 12 extending therefrom. Shank 12 includes a horizontal slot 16 near butt end 14 thereof. Modifications to end face 18 of butt end 14, as may also be seen in *Figure 2*, include a vertical groove or cutout section 19 extending the entire height of end face 18. Vertical cutout section 19 is defined by side walls 20 and 22 extending inwardly to end wall 24. Side edges 20 and 22 are positioned at an angle of from 30-45° from a line parallel to the longitudinal axis 26 of coupler shank 12, which is normal to edge faces 21 and 23 to either side of cutout section 19.

Referring now to *Figure 2*, coupler shank 12 is shown in a top view mounted in car center sill structure including side walls 30 and 32. A yoke having side sections 40 and 42 is received between the center sill side sections 30 and 32. A generally rectangular, flat, elongated key 38 passes through opening 34 in center sill side 30, opening 44 in yoke section 40, through slot 16 in coupler shank 12, through opening 46 in yoke side 42 and outward through opening 36 in center sill side 32.

A generally rectangular follower block 50 is placed between extensions 52 and 54 of the car center sill structure. The follower block 50 has convex curved side surfaces 56, 58 to minimize wear contact against the inside surfaces of center sill walls 52, 54. Extending from front face 60 of follower block 50 is projection 62 which is comprised of angled side walls 64 and 66 joined by a front wall 68. Front wall 68 is generally parallel to front face 60, although front wall 68 may be of a convex configuration. Side walls 64 and 66 extend from front wall 60 at an angle of from 30 to 45° from a perpendicular to front face 60. As best seen in *Figures 3* and 4, follower block 50 includes curved indentations 70, 72 to either side of side walls 64, 66. Indentations 70, 72 aid in the casting of projection 62 or follower block 50. Note that although projection 62 is not shown as extending for the entire height of follower 50, such an

embodiment could equally achieve the functional advantages described herein.

As shown in *Figure 2*, the maximum desired horizontal displacement of coupler butt 14 is shown in conjunction with horizontal angling limits as controlled by the width of coupler shank 12 and the spacing of yoke sections 40 and 46 or the spacing of sill sidewalls 30 and 32. Upon horizontal angling of coupler shank 12 or lateral displacement of its butt 14, contact will occur between sidewall 22 of coupler shank cutout and sidewall 64 of follower projection 62. Such contact will force follower 50 into contact with center sill sidewall 52 at side edge 56 of follower 50. Note that the follower may also be displaced from perpendicular alignment with sidewalls 52, 54 of the car center sill. Appropriate sizing of the coupler butt end cutout and projection 62 on follower block 50 is desired to avoid contact at the end 21 or 23 of coupler butt end 14 and yoke side 40 near its end 41. However, contact may occur under horizontal angling between coupler shank 12 and center sill side 32. This contact will be minimized to all but eliminate wear on coupler shank 12 due to the appropriate relative sizing and spacing of projection 62 on follower block 50 and the cutout portion 19 of coupler shank butt end 14.

Modifications to the apparatus described herein which retain at least certain of the envisaged advantages may be apparent to those of relevant skill, and the disclosure hereof is intended to encompass any such modifications regardless of whether any particular feature or features of the apparatus described and presently claimed is omitted.

100 CLAIMS

1. A railway coupler comprising an elongate shank received in a center sill structure, the shank having a butt end portion the end face of which is provided with a vertical groove, such groove being defined by two outwardly angled side walls and a rear wall extending between said side walls, the coupler further comprising a follower block of a generally rectangular shape having a vertical projection extending from a front face thereof, such projection being defined by two angled side walls and a front wall extending between said side walls, wherein the follower block projection is adapted to be received in the vertical groove of said shank end face so as to limit relative horizontal movement of the shank butt end portion.

2. A coupler as claimed in claim 1 wherein the end face of the shank butt end portion includes an edge face to each side of the vertical groove, said groove being of such depth relative to the follower block projection that when said coupler butt edge faces both flushly engage the follower front face either side of the projection, no contact occurs between the front wall of the projection and the rear wall of the groove.

3. A coupler as claimed in claim 1 or 2 wherein, upon horizontal angling of said coupler shank or lateral displacement of said butt end portion in said center sill structure, one of the angled side walls of said coupler butt end portion groove contacts the

adjacent angled side wall of said follower projection so as to limit the maximum displacement of said coupler butt end portion.

4. A coupler as claimed in claim 3 wherein said contact occurs prior to an outer edge portion of the coupler shank contacting an inner surface of said center sill structure.

5. A coupler as claimed in claim 3 wherein said contact occurs prior to an outer edge portion of the coupler shank contacting an inner surface of a yoke located within said center sill structure.

6. A coupler as claimed in any preceding claim wherein a maximum horizontal offset of said coupler butt end occurs when a side edge portion of said follower contacts an inner wall of said center sill.

7. A coupler as claimed in any preceding claim wherein said butt end portion groove side walls are outwardly angled at equal angles to said rear wall thereof.

8. A coupler as claimed in any preceding claim wherein said follower block projection side walls are outwardly angled at equal angles to said front wall thereof.

9. A coupler as claimed in any preceding claim wherein adjacent parts of said follower block projection side walls and said butt end portion groove side walls are inclined substantially at the same angle so as to form complementary surfaces.

10. A coupler as claimed in claim 9 wherein said angle is between 30 and 45° to the longitudinal axis of the shank.

11. A railway coupler substantially as herein described with reference to the accompanying drawings.

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